

REMARKS

The Examiner has rejected Claims 1-18. Applicant has amended Claims 1, 2, 5, 6, and 11. Reexamination and reconsideration of pending Claims 1-18 is respectfully requested.

The Examiner objects to Figure 1 of the disclosure because the blocks contained in the figure are not labeled with their associated reference numerals, 101, 102, 103, and 104. Applicant submits herewith informal drawings with corrections indicated in red.

The Examiner has rejected the specification under 35 U.S.C. §112, first paragraph, as failing to adequately teach how to make and/or use the invention. The Examiner states that it is unclear how a receiver object determines whether it has been given all the information it needs to execute a message to determine whether a query must be generated and sent back to the sender object. The Examiner states that there must be "an explanation of how this 'query' feature is accomplished, i.e., when a query is done, under what circumstances, based on what factors, how is it implemented." (emphasis in original)

Applicant contends that the specification is sufficient to enable one skilled in the art to make and use the invention, and, in particular, the 'query' feature noted by the Examiner.

As stated in the specification beginning at page 2, line 15, an object consists of data and one or more operations, procedures, or methods that can be performed by the data. The data needed and the operations that can be performed on that data are therefore inherent in an object's definition. Because the data and the operations that can be performed on the data are inherent in an object definition, an object can determine what operation(s) can be performed and what data is needed to perform the operation(s).

As stated in the specification beginning at page 22, line 7 for example, local process 901 includes a sender object 905 that sends a message to receiver object 909. Alternatively, the message is sent, for example, via the receiver proxy 904 that executes a *forward::* method to encode the message and transmit the message to the remote object 902. Thus, the receiver object 909 receives the message. The receiver object 909 of the remote process 902 decodes the message encoded as a Mach message, for example, for execution and handling in the remote process 902. The message received by the remote object includes the objective C message.

The remote object uses the information available to the remote object in its definition to determine whether it has been given all the information it needs to execute a message and/or to determine whether a query must be generated and sent back to the sender object for additional information, for example. Where additional information is needed, the present invention supports nested, recursive, remote messages. The specification beginning at page 23, line 6 and Figures 3B-3C provide an illustration of messaging used to obtain additional information.

Applicant therefore contends that the Specification is sufficient to enable one skilled in the art to make and use the invention, and, in particular, the 'query' feature.

The Examiner rejects Claims 5-7 and 11-18 under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the Specification. Applicant respectfully refers the Examiner to the Applicant's response to the 35 U.S.C. § 112, first paragraph rejection provided above. Given the response provided above, Applicant contends that Claims 5-7 and 11-18 are allowable.

The Examiner rejects Claims 1-18 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which Applicant regards as the subject matter of the invention.

Regarding Claims 1, 2, 5, 6, and 11, the Examiner states that the "providing" steps are unclear and must be clarified. The Examiner states that another term such as "sending", "transmitting", etc. is clearer. Applicant has amended Claims 1, 2, 5, 6, and 11 accordingly.

Regarding Claims 2-10, the Examiner states that they are rejected because they depend from previously rejected Claim 1. Applicant contends that independent Claim 1 is in condition for allowance. Therefore, Claims 2-10 being dependent on allowable claims are themselves allowable.

Regarding Claims 8 and 9, the Examiner states that they add irrelevant limitations to the claims from which they depend. Applicant respectfully disagrees. Applicant contends that Claims 8 and 9, being dependent on allowable claims, are allowable.

Regarding Claims 5 and 6, the Examiner states that it is unclear how the steps of Claim 5 fit into the steps of Claim 2, and how the steps of Claim 6 fit into the steps of Claim 5. The Examiner states that it is unclear whether the steps of Claims 5 and 6 execute directly after those of the claim upon which they depend. Further, the Examiner states that it is unclear whether these steps are executed every time a message is sent. The Examiner states that the steps seem to occur under certain circumstances such as when the second object needs further information from the first object. Applicant has amended Claims 5 and 6 accordingly. The Examiner states that these claims must be clarified in conjunction with the above 35 U.S.C. § 112, first paragraph rejection. Applicant respectfully refers the Examiner to the previous portion of this response related to the 35 U.S.C. § 112, first paragraph

rejection. Given this, Applicant contends that amended Claims 5 and 6 are now in condition for allowance.

Regarding Claims 12-18, the Examiner states that they are rejected because they depend from previously rejected Claim 11. Further, the Examiner states that Claims 15 and 16 add irrelevant limitations to the claims from which they depend. Applicant respectfully disagrees. Applicant contends that Claims 12-18, being dependent on an allowable independent claim, Claim 11, are therefore allowable.

The Examiner rejects Claims 1-4 and 8-10 under 35 U.S.C. §102(a), (b), and (e) as being unpatentable over McCullough, "Transparent Forwarding: First Steps", OOPSLA '87 Proceedings: Conference on Object Oriented Programming, Systems, Languages, and Applications, pp. 331-41, 12/1987 (hereinafter referred to as McCullough) and Bennett, "The Design and Implementation of Distributed Smalltalk", OOPSLA '87 Proceedings: Conference on Object Oriented Programming, Systems, Languages, and Applications, pp. 318-30, 12/1987 (hereinafter referred to as Bennett).

The Examiner states that both Bennett and McCullough indicate a system-dependent form of the message. Regarding McCullough, the Examiner states that the use of the **doesNotUnderstand:** primitive, the creation of an Ethernet packet, and the linearization of the arguments to the message clearly indicate a system-dependent form of the message which is transmitted to the receiver object.

The Examiner states that Bennett teaches a method that uses the **doesNotUnderstand:**, **perform:**, and **remoteSend:** primitives, a "RemoteObjectTable" which uses a "messageProcess" to construct a "messageArray" and the encoding of an "argument string". The Examiner

states that these features indicate a system-dependent form which is used during transmission of the message.

The Examiner states that Applicant's arguments filed March 10, 1993 were not persuasive because they were directed to perceived differences between the invention and the cited references rather than being directed to delineating specifically claimed features of the invention not taught by the cited references.

Applicant is unclear as to the applicability of 35 U.S.C. § 102(e) to the rejection of Claims 1-4 and 8-10 under 35 U.S.C. § 102 as it does not appear that the Examiner is relying on a "patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent" in rejecting Claims 1-4 and 8-10. Applicant requests that the Examiner explicitly state any such reference, if the Examiner continues to hold that this basis for rejection exists relative to Claims 1-4 and 8-10.

Regarding the McCullough reference, Applicant contends that it does not teach a system-dependent form of the message. In fact, McCullough teaches away from a system-dependent form of the message. In McCullough, a textual representation of the selector of the message and a linearization of each of the arguments to the message are encoded in an Ethernet packet. An Ethernet package is not system-dependent. Ethernet is a standardized communication protocol. It is therefore not system-dependent. Rather, it is designed to be system independent. There is nothing in McCullough that describes the encoding of an object oriented programming language based message into an operating system based message as is provided in Claim 1 of the present Application. McCullough merely teaches the encapsulation of a selector and the linearized arguments into an Ethernet packet, a system-independent communication protocol frame format.

Further, in McCullough, there is a single instance of class TransporterRoom at a host for each remote machine. The TransporterRoom takes care of communications protocols between machines as well as the linearization of messages and objects. The TransporterRoom that performs these duties for each remote machine is centralized at a host. Thus, where processes at the same host send a message to the same remote machine, the duties of taking care of communications protocols and linearizing messages and objects is performed external to the processes. These duties are performed by the central TransporterRoom instance that is associated with the remote machine at the host.

In contrast, Claim 1 of the present Application provides for the use of a proxy that is resident in the process. One of the functions of the process-resident proxy is to encode an object oriented programming language based message into an operating system based message for transmittal. A host can therefore have multiple proxies that are not central to the host but are resident within each process executing at the host that encode a message for transmittal. When two or more processes at a single host send a message to the same remote object resident on the same remote machine, there are multiple proxies at the single host that are encoding messages for the same remote machine. This is in direct contrast to the scheme used in McCullough where there is only a single transporterRoom instance for each remote machine.

In Bennett, there is one ProxyObject per host per remote object. There is one RemoteObjectTable per host. The single ProxyObject on a host represents a remote receiver to the local sender. The one RemoteObjectTable on a host represents a remote sender to the local receiver. The central ProxyObject is used for sending a message to a remote receiver, and the central RemoteObjectTable is used to receive and reply to messages sent by a central ProxyObject. Thus, every process executing within a host computer

that wishes to send a message to a remote receiver would use the one, central ProxyObject on the host. The ProxyObject is therefore not part of any one process, but is central to all of the processes executing on the host.

In contrast, Claim 1 of the present Application provides for the use of a proxy that is resident in the process that is sending a message. Because a proxy is resident in a process, every process resident at a host that sends a message can have a proxy. Thus, a host can have multiple proxies that are not central to the host but are resident within each process executing at the host. Further, when two or more processes at a single host send a message to the same remote object, there are multiple proxies at the single host for the one remote object referenced by the host. This is in direct contrast to the scheme used in Bennett where there is only one proxyObject per host per remote object referenced by the host.

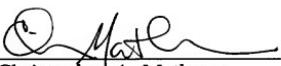
For at least the foregoing reasons, applicant contends that Claims 1-4 and 8-10 are not anticipated by Bennett or McCullough either alone or in combination. Therefore, Applicant contends that Claims 1-4 and 8-10 are allowable.

For the foregoing reasons, applicant contends that none of the references cited, either alone or in combination, teach, describe, or suggest the present invention. Applicant contends that pending Claims 1-18 are allowable.

Respectfully submitted,  
Hecker & Harriman

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By:

  
Christopher A. Mathews  
Reg. No. 35,944

2049 Century Park East  
Suite 1200  
Los Angeles, CA 90067  
(310) 286-0377

File No.: 10010.929

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